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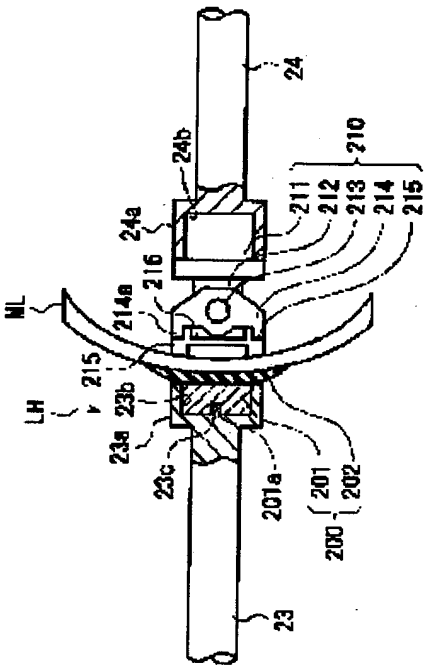
(54) LENS HOLDER

(57)Abstract:
PROBLEM TO BE SOLVED: To provide a lens holder for lens grinding apparatus which prevents a lens from being deformed and cracking even when grinding a thin eyeglass lens while holding it between a pair of lens rotary shafts.
SOLUTION: This lens holder for holding an eyeglass lens ML has an abutting part abutting on a refracting face of the lens ML. The lens holder is characterized in that the abutting part is divided into at least two and a contact member 215 capable of tilting independently is included.



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CLAIMS

[Claim(s)]
[Claim 1] It is the lens supporting structure characterized by having the contact section which contacts the refracting interface of a spectacle lens, having divided the aforementioned contact section into at least two in the lens supporting structure for holding a spectacle lens, and having the contact salient which can be tilted independently.

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DETAILED DESCRIPTION

[Detailed Description of the Invention]
[0001]
[The technical field to which invention belongs] this invention makes the lens axis of rotation pinch a spectacle lens, is held, carries out the grinding process of the spectacle lens to a predetermined ball type configuration with a grinding stone, and relates to the lens supporting structure of the lens grinding process equipment for ******(ing) on a spectacles frame.
[0002]
[Description of the Prior Art] The carriage in which the move drive to a longitudinal direction is [that the front end section is prepared in a rockable up and down focusing on the back end section as lens grinding attachment from the former] possible, The lens axis of rotation of the couple which was prolonged right and left and held at the front end section of the aforementioned carriage, There is a thing equipped with the grinding-stone drive motor which carries out the rotation drive of the lens shaft rotation drive motor which carries out the rotation drive of the aforementioned lens axis of rotation, the rise-and-fall drive motor which carries out the rise-and-fall drive of the front end section of the aforementioned carriage, the grinding stone arranged under the aforementioned lens axis of rotation, and the aforementioned grinding stone.
[0003] A spectacle lens (raw and circular processed lens) is made to hold between the lens axes of rotation of a couple in such lens grinding attachment. While carrying out the roll control of the aforementioned lens shaft rotation motor based on angle-of-rotation thetai of the ball type configuration data (thetai, rhoi) of spectacles (glasses) Based on radius vector rhoi of the ball type configuration data (thetai, rhoi) of spectacles (glasses), drive control of the aforementioned rise-and-fall drive motor is carried out. By making the front end section, the lens axis of rotation, and the spectacle lens of carriage correspond to angle-of-rotation thetai, carrying out a rise-and-fall drive in one, and carrying out the grinding process of the periphery section of this spectacle lens with the aforementioned grinding stone It is made for the wheel base of the lens axis of rotation and the grinding stone in angle-of-rotation thetai to become the last target with (the radius of a radius vector rhoi+ grinding stone).
[0004] by the way, the fixture attaching hole and presser foot which carry out opening to an end face at the opposite edge of the lens axis of rotation of a couple conventionally in order to make a spectacle lens hold between the opposite edges of the lens axis of rotation of such a couple -- a member -- the attaching hole is formed, respectively and the base of the lens adsorption fixture which stuck to the whole surface of a spectacle lens -- the fixture attaching hole of one lens axis of rotation -- removable -- fitting in -- the presser foot of the lens axis of rotation of another side -- a member -- while attaching a lens presser-foot member in an attaching hole, it is made to make a spectacle lens hold between the opposite edges of the lens axis of rotation of a couple by carrying out move adjustment of the lens axis of rotation of a couple in the direction approached mutually, and a spectacle lens's, boiling a lens presser-foot member on the other hand, and carrying out
[0005] As the lens supporting structure which consists of such a lens presser-foot member, an adhesive disk, or an adsorption fixture, the free lens presser foot which can respond to the inclination of the lens side which has the center of rotation on a lens axis is devised, and it is

actually used, for example, as indicated by JP,2-110459,U, JP,3-60319,U, JP,8-252754,A, JP,9-225798,A, JP,2001-47347,A, etc.
[0006]
[Problem(s) to be Solved by the Invention] However, own thickness of a lens becomes thin and a spectacle lens in recent years is [become] easy to deform by a raise in the refractiv index of a material, flat-ization of a criteria curve, etc. In the spectacle lens with especially the astigmatism, it was easy to deform in the direction of circles of longitude. For this reason, after the optical center of a spectacle lens with thin thickness and the axis of the lens axis of rotation had been in agreement, it also set, when making a spectacle lens hold by the lens adsorption fixture and the lens presser-foot member, and the spectacle lens had fear, like it can deform or divide with the load under processing from the plain-gauze fibers for plastering of deformation.
[0007] Moreover, in the lens supporting structure, since it is made to double the center of a lens adsorption fixture focusing on the optics of a spectacle lens in case a lens adsorption fixture is made to stick to a spectacle lens, when the center of a lens adsorption fixture was in agreement focusing on the optics of a spectacle lens and the base of a lens adsorption fixture is attached in the lens attaching hole of the lens axis of rotation, the optical axis of a spectacle lens does not incline in accordance with the axis of the lens axis of rotation.
[0008] However, when making a lens adsorption fixture stick to a spectacle lens, and it is difficult to double the center of a lens adsorption fixture correctly focusing on the optics of a spectacle lens and it attaches the base of a lens adsorption fixture in the lens attaching hole of the lens axis of rotation, the optical axis of a spectacle lens may incline somewhat to the axis of the lens axis of rotation.
[0009] And since the presser-foot force in which a lens presser-foot member presses down a spectacle lens inclined when a spectacle lens is pressed down by the lens presser-foot member after the spectacle lens has inclined to this appearance, probability of the spectacle lens, like it can deform or divide with the load under processing was high.
[0010] For this reason, corresponding free to the inclination corresponding to the inclination of a spectacle lens conventionally was called for. In order to satisfy this request, corresponding free to the inclination conventionally corresponding to the inclination of a spectacle lens is also considered.
[0011] However, it set, when the spectacle lens which is easy to deform was held, even if it took such measures, and the spectacle lens had fear, like it can deform or divide with the load under processing from the plain-gauze fibers for plastering of deformation.
[0012] Then, in this invention, even if it makes a spectacle lens with thin thickness hold between the lens axes of rotation of a couple and it carries out a grinding process, it aims at offering the lens supporting structure (lens presser-foot member) of the lens grinding process equipment which can prevent preventing deformation of a spectacle lens and being divided beforehand.
[0013]
[Means for Solving the Problem] In order to attain this purpose, the lens supporting structure of invention of a claim 1 has the contact section which contacts the refracting interface of a spectacle lens, the aforementioned contact section is divided into at least two in the lens supporting structure for holding a spectacle lens, and it is characterized by having the contact salient which can be tilted independently.
[0014]
[Embodiments of the Invention] Next, the gestalt of operation of this invention is explained based on a drawing.
[0015] In [composition] drawing 1 , the frame configuration measuring device (ball type configuration data measuring device) in which 1 reads the lens configuration information (thetai, rhoi) which is ball type configuration data from a lens frame configuration, the template or a ball type model of the spectacles frame F, etc., and 2 are lens grinding-process equipment (lens edger) which carries out the grinding process of the spectacle lens ML from a ground lens etc. based on the ball type configuration data of a spectacles frame inputted by transmission etc. from the frame configuration m asuring device In addition, since a well-known thing can be used for the frame configuration measuring device 1, explanation of the detailed composition, data

measuring method, etc. is omitted.
[0016] As shown in drawing 1 – drawing 3 , while upper surface (inclined plane) 3a which inclines in the anterior of the main part 3 of equipment is prepared, the working chamber 4 which carries out opening to the anterior part side (lower part side) of upper surface 3a is formed in the upper part of <lens grinding process equipment 2> lens grinding process equipment 2. This working chamber 4 is opened and closed with the covering 5 attached in the slanting upper and lower sides on the main part 3 of equipment at the slide operational.
[0017] Moreover, the liquid crystal display 8 on which it is located in more back than the lower part side of the control panel 6 located in the side of a working chamber 4, the control panel 7 located in the posterior part side from up opening of a working chamber 4, and a control panel 7, and the operation state by control panels 6 and 7 is displayed is formed in upper surface 3a of the main part 3 of equipment.
[0018] Furthermore, in the main part 3 of equipment, as shown in drawing 5 – drawing 7 , the grinding process section 10 which has a working chamber 4 is formed. This working chamber 4 is formed in the peripheral wall 11 of fixation in the grinding process section 10.
[0019] This peripheral wall 11 has the side attachment walls 11a and 11b on either side, posterior-wall-of-stomach 11c, 11d of front walls, and bottom wall 11e, as shown in drawing 5 (a) and drawing 7 . And the circular guide slit 11a1 and 11b1 are formed in side attachment walls 11a and 11b (refer for drawing 5 (a) or drawing 7 to either). Moreover, bottom wall 11e has the circular bottom wall (inclination bottom wall) 11e1 circularly prolonged in a near-side lower part from posterior-wall-of-stomach 11c as shown in drawing 5 (a) and drawing 6 , and the lower base wall 11e2 prolonged from the front soffit of the circular bottom wall 11e1 to 11d of front walls. 11f of drain pipes which are made to approach the circular bottom wall 11e1, and extend to a downward waste fluid tank (not shown) is prepared in this lower base wall 11e2.
[0020] (Covering 5) Covering 5 consists of panels of transparent and colorless, or the glass of one sheet of colored transparence (for example, colored transparence, such as a gray) and the product made of a resin, and is slid before and after the main part 3 of equipment.
[0021] "Clamp" switch 6a for clamping a control panel 6 with the lens shafts 23 and 24 of the couple which mentions a spectacle lens ML later, as shown in drawing 4 (A), (Control panel 6) "Left" switch 6b which performs specification of processing for [for right eyes] – left eyes of a spectacle lens ML, the change of a display, etc., and "right" switch 6c, The recompletion in the case of trying, printing and carrying out when the "grinding-stone move" switches 6d and 6e for which a grinding stone is moved to a longitudinal direction, and the finish of a spectacle lens ML are inadequate, or the recompletion / "trial" switch 6f for trying, printing and processing it, It has "lens rotation" switch 6g for lens rotation modes, and "stop" switch 6h for stop modes.
[0022] This is for mitigating the burden of operation of an operator by arranging a switch group required for actual lens processing in the position near a working chamber 4.
[0023] "Screen" switch 7a to which a control panel 7 switches the display state of a liquid crystal display 8 as shown in drawing 4 (B), (Control panel 7) "Memory" switch 7b which memorizes a setup about processing displayed on the liquid crystal display 8 etc., "Data demand" switch 7c for incorporating lens configuration information (thetai, rhoi), "-+" switch 7d (you may form the "-" switch and the "+" switch separately) of the seesaw formula used for numerical amendment etc. and "**" switch 7e for cursor formula pointer movement are arranged to the side of a liquid crystal display 8. Moreover, function keys F1-F6 are arranged under the liquid crystal display 8.
[0024] It is used at the time of a setup about processing of a spectacle lens ML, and also these function keys F1-F6 are used as an object for a response / selection to the message displayed on the liquid crystal display 8 at the processing process.
[0025] the time of a setup concerning [each function keys F1-F6] processing (layout screen) – – setting — a function key F1 — the object for a lens material input and a function key F4 are used for the object for a processing course input, and a function key F3, and the object for a beveling processing kind input and a function key F6 are used [the object for a lens kind input, and a function key F2] for the object for a frame kind input, and a function key
[0026] As a lens kind inputted with a function key F1, there are a "single focus", "ophthalmology

prescription", "successive promotion", "BAIFOKARU", "KYATARAKUTO", a "jar chestnut", etc. In addition, in the glasses industry, generally "KYATARAKUTO" means what has the large number of refractivities with a plus lens, and, as for a "jar chestnut", means what has the large number of refractivities with a minus lens.

[0027] As a processing course inputted with a function key F2, there are "auto", a "trial", a "monitor", "a frame substitute", etc.

[0028] As a material of the processed lens inputted with a function key F3, there are "plastics", "a high index", "glass", a "polycarbonate", an "acrylic", etc.

[0029] As a kind of glasses frame F inputted with a function key F4, there are "metal", a "cell", "OPUCHIRU", common ["common"], "trench digging (**)", "trench digging (inside)", "trench digging (**) etc.", etc. In addition, this ** "trench digging" shows the arris slot which is a kind of arris processing.

[0030] As a beveling processing kind inputted with a function key F5, there are "nothing", "smallness", being "inside", it is "size", "it is special", etc.

[0031] As mirror-plane processing inputted with a function key F6, there are "nothing", a "****", a "chamfering-of-the-edge section mirror plane", etc.

[0032] In addition, neither especially the mode, nor the classification or sequence of function keys F1-F6 mentioned above is limited. Moreover, the number of keys, such as forming the function key for choosing "finishing [processing]" a "layout" and "during processing", a "menu", etc. as selection of each tabs TB1-TB4 mentioned later, is not limited, either.

[0033] (Liquid crystal display 8) A liquid crystal display 8 is changed by the "layout" tab TB 1, the tab TB 2 "in processing", the "finishing [processing]" tab TB 3, and the "menu" tab TB 4, and has the function displays H1-H6 corresponding to function keys F1-F6 in a lower part. In addition, the color of each tabs TB1-TB4 has been independent, and changes to the same background color as each tabs TB1-TB4 simultaneously [the background of the circumference except each area E1-E4 mentioned later] with the selection change of each tabs TB1-TB4.

[0034] The whole (background) display screen to which the "layout" tab TB 1 and its tab TB 1 were given For example, blue, The whole (background) display screen to which red, the "menu" tab TB 4, and its tab TB 4 were given by green and the whole (background) display screen to which the "finishing [processing]" tab TB 3 and its tab TB 3 were given is displayed for the whole (background) display screen to which the tab TB 2 "in processing" and its tab TB 2 were given in yellow.

[0035] Thus, since each tabs TB1-TB4 classified by color for every work and a surrounding background are displayed in the same color, an operator can recognize or check easily whether which it is under work now.

[0036] A thing as occasion demands is displayed suitably, and the function displays H1-H6 can display a different pattern from the thing corresponding to the function of function keys F1-F6, a numeric value or a state, etc., when it is in a non-display state. Moreover, when operating function keys F1-F6 (for example, when operating the function key F1), whenever it clicks the function key F1, the display in the mode etc. may change. For example, it is also possible to display the list in each mode corresponding to a function key F1, and to raise selection (pop-up display) operation. Moreover, a list pop-up on display is expressed with a character, a figure, or an icon.

[0037] It is displayed in the state where it divided in the icon display area E1, the message indicator area E2, the digital-readout area E3, and the status-display area E4, in the state where the "layout" tab TB 1, the tab TB 2 "in processing", and the "finishing [processing]" tab TB 3 were chosen. Moreover, on the whole, it is displayed as one menu display area in the state where the "menu" tab TB 4 was chosen. In addition, in the state where the "layout" tab TB 1 is chosen, the tab TB 2 "in processing" and the "finishing [processing]" tab TB 3 are not displayed, but when a layout setup is completed, you may display.

[0038] In addition, since a layout setup using the liquid crystal display 8 which was mentioned above is the same as that of an application for patent No. 287040 [2000 to], or an application for patent No. 290864 [2000 to], detailed explanation is omitted.

[0039] The <grinding process section 10> grinding process section 10 is equipped with the screw

shaft 15 interlocked with the output shaft (not shown) of the tray 12 of fixation on the main part 3 of equipment, the base 13 arranged on this tray 12, the base drive motor 14 fixed to the tray 12, and the base drive motor 14 with which the nose of cam was supported possible [rotation] by supporter 12a (refer to drawing 8) started from the tray 12 like drawing 7 and drawing 8 . Moreover, the grinding process section 10 is equipped with the rotation drive system 16 of a spectacle lens ML, the grinding system 17 of a spectacle lens ML, and the KOBA thick system of measurement (KOBA thick measurement means) 18 of a spectacle lens ML.

[0040] (Base 13) the side prolonged in an anterior from the left end section of posterior supporter 13a to which the base 13 extends right and left along with the trailing-edge section of a tray 12, and posterior supporter 13a — it is formed in the shape of abbreviation for V characters from side supporter 13b on the right-and-left both ends of this posterior supporter 13a, the axial V block-like supporters 13c and 13d are fixed — having — the side — V block-like axial supporter 13e is being fixed on the front end section of side supporter 13b

[0041] Moreover, in the main part 3 of equipment, it is prolonged right and left and the parallel guide bars 19 and 20 of the couple installed in parallel forward and backward are arranged. The right-and-left both ends of these parallel guide bars 19 and 20 are attached in the portion of right and left in the main part 3 of equipment. and — these parallel guide bars 19 and 20 — the side of the base 13 — side supporter 13b is supported to revolve by right and left possible [forward/backward moving] along the direction of an axis

[0042] Moreover, the both ends of the carriage fixed pivot 21 prolonged right and left are arranged in V slot on axial supporter 13c and 13d. 22 is carriage attached in the carriage fixed pivot 21. the two forks from 22d of support projected parts which protruded on the right-and-left center section of successive formation section 22c which this carriage 22 is prolonged right and left with the arm sections 22a and 22b for axial attachment which set an interval right and left and are prolonged in a position and order, and is forming successively between the back end sections of the arm sections 22a and 22b, and successive formation section 22c towards back -- it is formed in the configuration In addition, the arm sections 22a and 22b and successive formation section 22c have become KO character-like. The peripheral wall 11 which forms a working chamber 4 between this arm section 22a and 22b is arranged.

[0043] And while this carriage fixed pivot 21 penetrates 22d of support projected parts and is held at 22d of support projected parts, rotation of it is attained to the axial supporters 13c and 13d. The carriage 22 front-end section side has come to be able to carry out vertical rotation focusing on the carriage fixed pivot 21 thereby. In addition, it may fix to the axial supporters 13c and 13d, and the carriage fixed pivot 21 may make 22d of support projected parts hold impossible [movement in a rotatable and the direction of an axis] to the carriage fixed pivot 21.

[0044] This carriage 22 is equipped with the lens supporting structure LH which holds a spectacle lens ML as shown in drawing 5 (b) and drawing 13 . This lens supporting structure LH is equipped with the lens shafts 23 and 24, and the lens adsorption fixture 200 and the lens presser-foot fixture 210 of a couple.

[0045] These lens shafts 23 and 24 are prolonged right and left, and are arranged in series on the same axle. And the lens shaft 23 is held at the point of arm section 22a impossible [movement in the direction of an axis] free [the rotation to the circumference of an axis] while it turns the point of arm section 22a to right and left and penetrates. Moreover, the lens shaft 24 is held at the point of arm section 22b possible [move adjustment in the direction of an axis] free [the rotation to the circumference of an axis] while it turns the point of arm section 22b to right and left and penetrates. Since well-known structure is adopted as this structure, the detailed explanation is omitted. Thus, carriage 22 is equipped with them in the state where it was arranged in series in the shape of a straight line while the lens shafts 23 and 24 have the same axis.

[0046] These lens shafts 23 and 24 have the edges (opposite edge) 23a and 24a which count r, 23b is formed for the fixture attaching hole which carries out opening to an end face at edge 23a, and fixture attaching hole 24b which carries out opening to an end face is formed in edge 24a. And positioning projected part 23c prolonged in the shape of a straight line is formed in the

base of fixture attaching hole 23b.
[0047] Furthermore, the lens adsorption fixture 200 has the adsorption cup 202 made of rubber by which printed on the other end side of the attachment base 201 pillar-shaped at metal which has straight-line-like positioning slot 201a in an end side, and the attachment base 201, and fixing or adhesion fixation was carried out.
[0048] the rotation held free [rotation to the both ends of the axis of rotation 213 which the lens presser-foot fixture 210 penetrated the attachment base 211 pillar-shaped at metal shown in drawing 13 , drawing 14 , and drawing 17 , the support projected part 212 which protruded in the center of an end side (apical surface) of the attachment base 211, and the support projected part 212, and was held at the support projected part 212, and the axis of rotation 213] — it has a member 214,214 this the rotation of each — the attachment projected parts 214a and 214a are formed in the near edge distant [each other / the end face of a member 214] And the attachment base 211 is attached or screwed on fixture attaching hole 24b of the lens shaft 24.
[0049] moreover, each rotation of the lens presser-foot fixture 210 — the contact section to a spectacle lens is prepared in the member 214 that is, this contact section is divided into two — having — each rotation — it has the contact member 215,215 made of rubber (a press member, lens presser-foot member) attached in the attachment projected parts 214a and 214a of a member 214 as a contact projected part (contact salient)
[0050] this contact — a member 215,215 — rotation — it is prepared on the edge of the side left mutually [the nose of cam of a member 214] here — contact — assumption of a virtual flat surface including the center between members 215,215 and the center line (presser foot a member rotation axis) of the axis of rotation 213 forms the contact member (contact projected part) 215,215 symmetrically to the virtual flat surface moreover, each rotation — two of members 214 — contact of a lot — members 215,215 are formed successively by one in the successive formation section 216 of a tabular
[0051] thus, each rotation — a member 214,214 — two — contact of a lot — the member 215,215 is formed, respectively therefore, the lens presser-foot fixture 210 — four contact — it has a member 215 as a contact projected part in addition, contact — since the member 215 is made of the elastic body — this contact — as the member 215 was mentioned above, one contact member (lens presser-foot section) which straddles to the position containing four contact members can be prepared without preparing by dividing into four, and also let the apical surface of this one contact member (lens presser-foot section) be the one contact surface (lens presser-foot side)
[0052] Moreover, 13f of guide sections is formed in the base 13 at one, and the screw shaft (delivery screw) 15 is screwed on 13f of guide sections. And by operating the base drive motor 14 and carrying out the rotation drive of the screw shaft 15 with the base drive motor 14, forward/backward moving of the 13f of the guide sections is carried out in the direction of an axis of the screw shaft 15, and the base 13 moves to 13f of guide sections, and one. Under the present circumstances, the base 13 is shown at the parallel guide bars 19 and 20 of a couple, and displaces along the direction of an axis.
[0053] The guide slit 11a1 of the peripheral wall 11 which carried out [carriage 22] ****, and 11b1 are circularly formed focusing on the carriage fixed pivot 21. And the edge where the lens shafts 23 and 24 made to hold on carriage 22 counter mutually is inserted in the guide slit 11a1 and 11b1. This has projected the opposite edge of the lens shafts 23 and 24 in the working chamber 4 surrounded by the peripheral wall 11.
[0054] Moreover, as shown in the internal surface of side-attachment-wall section 11a at drawing 5 (a), it is circular, and as the cross-section hat-like guide plate P1 was attached and it was shown in the internal surface of side-attachment-wall section 11b at drawing 7 , it is circular, and the cross-section hat-like guide plate P2 is attached. The guide slit 11a1, guide slit circularly prolonged corresponding to 11b1 11a2', and 11b2' are formed in these guide plates P1 and P2.
[0055] And between side-attachment-wall section 11a and a guide plate P1, it is arranged possible [movement] up and down, the order and covering board 11b2 which closes the guide slit 11b1 and 11b2' between side-attachment-wall section 11b and a guide plate P2 reaches

approximately, and the guide slit 11a1 and the covering board 11a2 which closes 11a2' are arranged in it possible [movement] up and down. Moreover, the lens shafts 23 and 24 have penetrated the covering board 11a2 and 11b2 respectively free [sliding]. Thereby, the covering board 11a2 and 11b2 are attached in the lens shafts 23 and 24 possible [relative displacement in the direction of an axis], respectively.

[0056] And the circular guide rails Ga and Gb which are located in the upper and lower sides of the guide slit 11a1 and 11a2' at a guide plate P1, and meet the guide slit 11a1 and the vertical edge of 11a2' are formed. The circular guide rails Gc and Gd which are located in the upper and lower sides of the guide slit 11b1 and 11b2' at a guide plate P2, and meet the guide slit 11b1 and the vertical edge of 11b2' are formed. The covering board 11a2 is guided and has come to be able to carry out vertical movement of the upper and lower sides circularly at guide rails Ga and Gb, and the covering board 11b2 is guided in the upper and lower sides at guide rails Gc and Gd, and has come to be able to carry out vertical movement of it circularly.

[0057] And the lens shaft 23 of carriage 22 penetrates the circular covering board 11a2 free [sliding]. Improve attachment nature of the lens shaft 23, the side-attachment-wall section 11a1, a guide plate P1, and the covering board 11a2, and the lens shaft 24 of carriage 22 penetrates free [sliding of the circular covering board 11b2]. Attachment nature of the lens shaft 24, the side-attachment-wall section 11b1, a guide plate P2, and the covering board 11b2 is improved.

[0058] moreover, between the covering board 11a2 and the lens shafts 23 — a seal — while the seal is carried out through Member Sa — the covering board 11a2 — the lens shaft 23 — a seal — it is held through Members Sa and Sa furthermore, between the covering board 11b2 and the lens shafts 24 — a seal — while the seal is carried out through Member Sb — the covering board 11b2 — the lens shaft 24 — a seal — it is held possible [relative displacement] in the direction of an axis through Members Sb and Sb Thereby, if the lens shafts 23 and 24 rotate circularly up and down along with the guide slit 11a1, 11a2' and 11b1, and 11b2', the covering board 11a2 and 11b2 are movable to the lens shafts 23 and 24 and one up and down. in addition, a seal — when it carries out whether it is made to hold to the covering board 11a2, or the periphery section is arranged between the covering board 11a2 and side-attachment-wall section 11a and between the covering board 11a2 and a guide plate P1 and the lens shaft 23 moves in the direction of an axis, you may make it Member Sa not move in the direction of an axis of the lens shaft 23 moreover — the same — a seal — when it carries out whether it is made to hold to the covering board 11b2, or the periphery section is arranged between the covering board 11b2 and side-attachment-wall section 11b and between the covering board 11b2 and a guide plate P2 and the lens shaft 24 moves in the direction of an axis, you may make it Member Sb not move in the direction of an axis of the lens shaft 24

[0059] In addition, the side-attachment-wall section 11a1 and the guide plate P1 are approaching so that it may stick with the circular covering board 11a2, and the side-attachment-wall section 11b1 and the guide plate P2 are approaching so that the circular covering board 11b2 may be stuck.

[0060] Furthermore, the guide plates P1 and P2 of the working chambers 4 When installing to near posterior wall 11c and the lower base wall 11e2 and making it a vertical edge go out by per the side of a feeler 41, and near the upper [of a grinding stone 35] When opening the vertical edge of guide plates P1 and P2 wide in a working chamber 4 and making it a grinding fluid flow in accordance with the side-attachment-wall section 11a1 and the inside of 11b1, a grinding fluid collects between the side-attachment-wall section 11a1 and a guide plate P1 and between the side-attachment-wall section 11b1 and a guide plate P2.

[0061] And when the lens shafts 23 and 24 vertical-rotation-move [carriage 22] up and down along with the guide slit 11a1 and 11b1 focusing on the carriage fixed pivot 21, The covering board 11a2 and 11b2 move up and down to the lens shafts 23 and 24 and one, the guide slit 11a1 and 11b1 are in the covering board 11a2 and the state where it was always closed by 11b2, and the grinding fluid in a peripheral wall 11 etc. leaks to the outside of a peripheral wall 11. In addition, a spectacle lens ML does approach and estrangement of to a grinding stone 35 with vertical movement of these lens shafts 23 and 24.

[0062] In addition, at the time of wearing on the lens shafts 23 and 24, such as a ground lens of a spectacle lens ML, and the secession after a grinding process end, carriage 22 is located focusing on rotation of the vertical direction so that the lens shafts 23 and 24 may be located in the mid-position of guide slot 11a. Moreover, according to the amount of grinding processes of a spectacle lens ML, vertical rotation control is carried out at the time of KOBA thick measurement and a grinding process, and carriage 22 is made to incline.
[0063] (Rotation drive system 16 of the lens shafts 23 and 24) The rotation drive system 16 of the lens shafts 23 and 24 The motor 25 for a lens shaft drive fixed to carriage 22 with the fixed means which omitted illustration, Power transfer shaft (driving shaft) 25a which is held free [rotation on carriage 22], and is interlocked with the output shaft of the motor 25 for a lens shaft drive, It has follower gear 26a which geared with the drive gear 26 prepared at the nose of cam of power transfer shaft 25a on the drive gear 26, and was attached in one lens shaft 23. In drawing 8 , worm gearing is used for the drive gear 26, and the worm wheel is used for follower gear 26a. In addition, a bevel gear (bevel gear) can be used for the drive gear 26 and follower gear 26a.
[0064] Furthermore, the rotation drive system 16 is equipped with the pulley 27 fixed to the heel (the lens shaft 24 side is the edge of an opposite side) of one lens shaft 23, the power transmission device 28 formed in carriage 22, and the pulley 29 held free [the rotation to the heel (the lens shaft 23 side is the edge of an opposite side) of the lens shaft 24 of another side]. While being prepared in the direction of an axis possible [relative displacement] to the lens shaft 24, when move adjustment of the lens shaft 24 is carried out in the direction of an axis, move regulation of this pulley 29 is carried out by the move specification-part material which was prepared in carriage 22 so that the position of the direction of an axis might not change and which is not illustrated.
[0065] A power transmission device 28 has transfer shaft (power transfer shaft) 28c by which the transfer pulleys 28a and 28b and the transfer pulleys 28a and 28b were fixed to both ends. This transfer shaft 28c is held free [rotation on carriage 22] by the bearing which is not illustrated while it is arranged in parallel with the lens shafts 23 and 24. Moreover, the power transmission device 28 is equipped with follower side belt 28e over which it was built between driving-side belt 28d over which it was built between a pulley 27 and transfer pulley 28a, and a pulley 29 and transfer pulley 28b.
[0066] If the motor 25 for a lens shaft drive is operated and power transfer shaft 25a is rotated, rotation of power transfer shaft 25a will be transmitted to the lens shaft 23 through the drive gear 26 and follower gear 26a, and the rotation drive of the lens shaft 23 and the pulley 27 will be carried out at one. On the other hand, rotation of a pulley 27 is transmitted to a pulley 29 through driving-side belt 28d and transfer pulley 28a, transfer shaft 28c, transfer pulley 28b, and follower side belt 28e, and the rotation drive of a pulley 29 and the lens shaft 24 is carried out at one. Under the present circumstances, it synchronizes in the lens shaft 24 and the lens shaft 23, and rotates in one.
[0067] (Grinding system 17) The grinding system 17 has the grinding stone 35 fixed to the grinding-stone drive motor 30 fixed to the tray 12, the transfer shaft 32 with which the drive of the grinding-stone drive motor 30 is transmitted through a belt 31, the wheel-spindle section 33 which rotation of the transfer shaft 32 is delivered, and the wheel-spindle section 33. In addition, this grinding stone 35 has the rough grinding grinding stone which omitted the sign, an arris grinding stone, a finish grinding stone, etc. This rough grinding grinding stone, the arris grinding stone, and the finish grinding stone are installed in the direction of an axis.
[0068] Moreover, the rotation arm drive motor 36 with which the grinding system 17 was fixed to the main part 3 of equipment, Worm-gearing 36a fixed to this output shaft, and the worm 37 of the shape of a cylinder axis held free [rotation] at the peripheral wall 11, It has the axis of rotation 39 which is held free [rotation of the end section] at the free edge of the inside of warm the rotation arm 38 of the hollow which fixed in one to 37 and drawing 5 (a), and the rotation arm 38, and projects towards the method of the right from this free edge, and the **** grinding stone 40 fixed to th axis of rotation 39.
[0069] The grinding system 17 has the power transmission device which is arranged in the

rotation arm 38 and delivers rotation of the output shaft of drive-motor 39a drive-motor 39a by which the output shaft which it is attached in a peripheral wall 11, and is not illustrated was inserted in in tubed worm-shaft 39a to the axis of rotation 39.
[0070] The **** grinding stone 40 has the chamfering-of-the-edge grinding stones 40a and 40b which give chamfering-of-the-edge processing to the periphery section of a spectacle lens ML as shown in drawing 5 (a) and drawing 7 , and **** cutter 40c which adjoined chamfering-of-the-edge grinding-stone 40a, and was attached in the axis of rotation 39. Moreover, among drawing 5 (a), it is prolonged in the method of the right and circular covering 38a is attached in the rotation arm 38. This circular covering 38a has covered the lower part of the chamfering-of-the-edge grinding stones 40a and 40b and **** cutter 40c.
[0071] (Grinding-fluid supply structure) As mentioned above, bottom wall 11e of the peripheral wall 11 which forms a working chamber 4 has the circular wall 11e1 and the lower base wall 11e2. This circular wall 11e1 is circularly formed considering the carriage fixed pivot 21 as a center.
[0072] Moreover, as mentioned above, a peripheral wall 11 has back wall 11c and 11d of front walls. And grinding-fluid **** nozzle 60A which carries out opening towards the front is attached in the center of a longitudinal direction of the soffit section of back wall 11c as a grinding-fluid supply means, and grinding-fluid **** nozzle 61A which projects towards back is attached in 11d of front walls as a grinding-fluid supply means. in addition, ** to which grinding-fluid **** nozzle 60A breathes out a grinding fluid from the whole cross direction of back wall 11c — it can prepare broadly like In this case, even if grinding waste etc. disperses in which place of the circular bottom wall 11e1, it can prevent that flush this grinding waste below by the grinding fluid, and grinding waste adheres to the circular bottom wall 11e1.
[0073] The 1st grinding-fluid delivery (1st grinding-fluid supply means) 63 which breathes out and supplies a grinding fluid 62 so that the upper part of grinding side 35a of a grinding stone 35 and the lens shaft 23, and the portion by the side of 24 may be covered in grinding-fluid **** nozzle 61A, and the 2nd grinding-fluid delivery (2nd grinding-fluid supply means) 65 which supplies a grinding fluid 64 from a normal to grinding side 35a of a grinding stone 35 are formed in one. These grinding-fluid deliveries 63 and 65 have branched from grinding-fluid supply path 61a.
[0074] In addition, a grinding fluid 62 passes a lower part more slightly than the lens shafts 23 and 24, and flows down below while it is circularly breathed out towards back from the grinding-fluid delivery 63. here, when the vertical line which passes along the center of rotation O of a grinding stone 35 was set to 36 and the tangent which passes along the intersection of a vertical line 36 and grinding side 35a was set to 37, the grinding fluid 62 was shown by the abbreviation tangent 37 and this direction 68, i.e., an arrow, — as — the back from the grinding-fluid delivery 63 — and it is breathed out towards a direction parallel to a tangent 67
[0075] furthermore, the width of face of the longitudinal direction of the grinding-fluid delivery 65 — the longitudinal-direction width of face of a grinding stone 35, and abbreviation — it is the same or is formed more broadly than the width of face of the longitudinal direction of a grinding stone 35 Thereby, sufficient grinding fluid for grinding side (peripheral surface) 35a of a grinding stone 35 can be supplied.
[0076] Moreover, the width of face of the longitudinal direction of the grinding-fluid delivery 63 is formed more broadly than the width of face of the longitudinal direction of the grinding-fluid delivery 65. And the right-and-left both ends of the grinding-fluid delivery 63 are further projected from the longitudinal-direction both ends of the grinding-fluid delivery 65.
[0077] Thus, while forming more broadly than the width of face of the longitudinal direction of the grinding-fluid delivery 65 the width of face of the longitudinal direction of the grinding-fluid delivery 63, by setting a grinding fluid 62 and making grinding side 35a and few intervals breathe out, the grinding fluid 62 breathed out from the grinding-fluid delivery 63 can set grinding side 35a and an interval, and can cover the lens grinding section (point processing [lens]) 69 side of grinding side 35a in the shape of a curtain.
[0078] By the way, in such composition, water supply becomes possible enough about a grinding fluid 64 to the point (lens grinding section 69) processing [lens] by supplying water from a

normal to grinding side 35a from the grinding–fluid delivery 65 in a grinding fluid 64 (supply). The grinding fluid to which water was supplied by grinding side 35a is flown by rotation of a grinding stone 35 in the upper part or back, and, thereby, the problem of this method is a grinding fluid's dispersing in the upper part of the grinding room 4, or back, having leaked enough (leaking), and soiling back wall 11c, the lens shaft 23, and 24 grades.

[0079] However, a grinding fluid 62 is an abbreviation tangential direction from the grinding–fluid delivery 63, and is breathed out towards back, and covers the upper part and the point (lens grinding section 69) processing [lens] of grinding side 35a of a grinding stone 35 in the shape of a curtain. Under the present circumstances, since the width of face of the curtain–like grinding fluid 62 is formed more widely than the width of face of the grinding fluid 64 breathed out from the grinding–fluid delivery 65, it is prevented that the grinding fluid 64 breathed out from the grinding–fluid delivery 65 disperses towards back by rotation of a grinding stone 35. It is prevented that a grinding fluid disperses in the upper part of the grinding room 4 or back, has leaked enough (leak), and soils back wall 11c, the lens shaft 23, and 24 grades by this.

[0080] In addition, the grinding fluid 62 which is an abbreviation tangential direction from the tangential–direction water supply 63, i.e., a grinding–fluid delivery, and is breathed out towards back can enlarge more the water splashes prevention effect by the water splashes prevention when grinding side 35a of a grinding stone 35 is not contacted directly are detaching a grade and according to tangential–direction water supply of a grinding fluid 62, and the direction water supply of a normal of a grinding fluid 64.

[0081] Moreover, since the tangential direction of a grinding stone 35 is attained to, respectively and grinding fluids 62 and 64 are supplied in the 2 of the direction of a normal of a grinding stone 35 directions, a grinding fluid can be uniformly supplied to grinding side 35a of a grinding stone 35, and a spectacle lens ML. Furthermore, since the deliveries 63 and 65 which supply a grinding fluid were formed in the two directions, the tangential direction of a grinding stone 35, and the direction of a normal, at one grinding–fluid supply nozzle (grinding–fluid feeder) 61, the grinding–fluid supply nozzle (grinding–fluid feeder) 61 and the whole grinding attachment can be miniaturized, and it can miniaturize.

Near the carriage fixed pivot 21 of the <pressure regulation mechanism 45> carriage 22, the pressure regulation mechanism 45 in which the amount of pressure weldings to the grinding stone 35 of a spectacle lens ML is adjusted is established.

[0082] the move child fixed to the bracket 47 fixed to carriage 22 with a screw 46, and the bracket 47 as the pressure regulation mechanism 45 was shown in drawing 10 — a variation rate — the ** motor 48 and a move child — a variation rate — it has the move child 50 screwed on screw shaft 48a interlocked with the output shaft which the ** motor 48 does not illustrate, and screw shaft 48a (refer to drawing 9) And the point of screw shaft 48a is held free [rotation to a bracket 47], and it is shown to the move child 50 to it in the direction of an axis by the guide rail 49 parallel to screw shaft 48a.

[0083] Furthermore, the pressure regulation mechanism 45 has the hauling string 55 by which ends were held at three pulleys 51, 52, and 53 held possible [rotation] at the base 13, and the move children 50 and springs 54. This hauling string 55 is turned into pulleys 51, 52, and 53 so that the move child 50 may be pulled from the direction which carries out an abbreviation rectangular cross with a guide rail 49 according to the hauling force of a spring 54. In addition, the other end of a spring 54 is being fixed to the base 13.

[0084] It is used for the pressure regulation mechanism 45 that the distance from the carriage fixed pivot 21 carries out adjustable with the position on the move child's 50 guide rail 49, and the energization force by the side of the nose of cam of the carriage 22 according to the hauling force of a spring 54 according to the position, i.e., the energization pressure to the grinding stone 35 of a spectacle lens ML pinched at the lens shafts 23 and 24, changes. In addition, screw shaft 48a and a guide rail 49 carry out an abbreviation rectangular cross at the lens shaft 23 and the carriage fixed pivot 21.

[0085] therefore, the thing done according to change of processing conditions, such as a difference in the touch area according the contact state to the grinding stone 35 of a spectacle lens ML to the gap from [the] pressurization, and change of the configuration of a spectacle

lens ML, and a KOBA width-of-face difference arising from lens frequency, for the variation rate of the position on the move child's 50 guide rail 49 — the hauling force of a spring 54 — abbreviation — in spite of being the same, the contact force per unit area can be adjusted
[0086] In addition, since carriage 22 inclines from the mid-position according to the amount of grinding processes of a spectacle lens ML as mentioned above, of course, the pressure regulation mechanism 45 is located in the inclination side. Moreover, since it is possible to change the applied force equivalent to the energization force by the side of the nose of cam of carriage 22 even if it uses the move child 50 as mere weight and abolishes pulleys 51, 52, and 53, a spring 54, and the hauling string 55, since it is in the state where carriage 22 inclines, it is also possible to adjust the contact pressure force to the grinding stone 35 of a spectacle lens ML according to the position on the move child's 50 guide rail 49.
As it is indicated in drawing 9 as <the wheel base adjustment means 43> in time, it is adjusted by the wheel base adjustment means (wheel base adjustment mechanism) 43 between the lens shafts 23 and 24 and the wheel-spindle section 33.
[0087] The wheel base adjustment means 43 has the axis of rotation 34 to which an axis is located on the same axis as the wheel-spindle section 33, as shown in drawing 9 . This axis of rotation 34 is supported by V Mizogami of support projected part 13e of drawing 8 free [rotation].
[0088] Moreover, the base board 56 which made the wheel base adjustment means 43 hold to the axis of rotation 34, The parallel guide rails 57 and 57 of the couple which is attached in the base board 56 and prolonged in the slanting upper part from the upper surface, The screw shaft 58 prepared in the base board 56 possible [a guide rail 57, parallel, and rotation] (delivery screw), The screw shaft 58 is screwed on with the stepping motor 59 which it is prepared [stepping motor] in the undersurface of the base board 56, and rotates the screw shaft 58, and it has the cradle 60 (expedient upper illustration abbreviation of illustration of the portion of others [drawing 7]) held free [vertical movement] at guide rails 57 and 57.
[0089] furthermore, the reinforcement which the wheel base adjustment means 43 is arranged above a cradle 60, holds the lens shaft electrode holder 61 held free [vertical movement] at guide rails 57 and 57, and the upper limit of guide rails 57 and 57, and is held free [rotation of the upper-limit section of the screw shaft 58] — it has the member 62 Always, rotation energization is carried out by the spring force of the self-weight of carriage 22, and the spring 54 of the pressure regulation mechanism 45, and this lens shaft electrode holder 61 is pushed against a lower part at a cradle 60. Moreover, the sensor S which detects that the lens shaft electrode holder 61 contacted is attached in this cradle 60.
[0090] And if a cradle 60 is gone up or dropped along with guide rails 57 and 57 with the screw shaft 58 by rotating normally or reversing a stepping motor 59, and rotating normally or reversing the screw shaft 58, the lens shaft electrode holder 61 will be gone up or dropped by a cradle 60 and one. Thereby, carriage 22 rotates focusing on the carriage fixed pivot 21.
The KOBA thick system of measurement (RENZUKOBA thick measuring device) 18 as a <KOBA thick system-of-measurement 18> lens configuration measuring device The gauge head 41 arranged in the trailing-edge upper part of a working chamber 4 as shown in drawing 5 (a) and drawing 7 , It has the test section (gauge-head movement magnitude detecting element) 42 which was prepared in parallel with the lens shafts 23 and 24, and the end made approach a gauge head 41, measurement shaft 42a prepared in one, and the trailing-edge side upper part of side-attachment-wall 11b, and was arranged in the outside of a working chamber 4. This measurement shaft 42a penetrated side-attachment-wall 11b, and has projected it within and without the working chamber 4.
(Gauge head 41) A gauge head 41 has the feeler 101,102 of a couple while having the feeler attachment component 100, as shown in drawing 5 (a), drawing 7 , drawing 13 - drawing 18 , drawing 23 , and drawing 24. The feeler attachment component 100 has the parallel pieces 100b and 10c of opposite which protruded on the right-and-left both ends of successive formation section 100a prolonged right and left and successive formation section 100a towards this direction. Moreover, the point of the pieces 100b and 100c of opposite is countered, and the feeler 101,102 is attached while being formed in the shape of a pillar. And the inclined planes

101a and 102a which incline and attend successive formation section 100a are formed in the point of a gauge head 101,102. Thereby, as shown in drawing 15 , the circular contact edges 101b and 102b are formed at the nose of cam of a gauge head 101,102. Furthermore, the nose of cam 101b1,102b1 of the contact edges 101b and 102b of a gauge head 101,102 is formed as flat-tapped as the nose of cam 100b1,100c1 of the pieces 100b and 100c of opposite.

[0091] Moreover, the feeler attachment component 100 is attached in measurement shaft 42a which penetrates side-attachment-wall 11b and is prolonged right and left as shown in drawing 7 . This measurement shaft 42a is held possible [movement right and left] at the test section 42 arranged in the outside of side-attachment-wall 11b. And this test section 42 detects the movement magnitude to right and left of the feeler attachment component 100 through measurement shaft 42a.

[0092] (Control circuit) The above-mentioned control panels 6 and 7 (namely, each switch of control panels 6 and 7) are connected to the operation control circuit (operation control means) 80 which has CPU as shown in drawing 11 (a). Moreover, while ROM81 as a storage means, the data memory 82 as a storage means, and RAM83 are connected, the correction value memory 84 is connected to this operation control circuit 80.

[0093] Furthermore, while the liquid crystal display 8 is connected through the driver 85 for a display, the stepping motor driver (stepping motor drive circuit) 86 is connected to the operation control circuit 80. this stepping motor driver 86 carries out operation control by the operation control circuit 80 — having — the various drive motors 14 of the grinding process section 10, i.e., a base drive motor, the motor 25 for a lens shaft drive, the rotation arm drive motor 36, and a move child — a variation rate — operation control (drive control) of the ** motor 48 and the stepping motor 59 grade is carried out In addition, a stepping motor is used for the base drive motor 14, the motor 25 for a lens shaft drive, the rotation arm drive motor 36, and the motor 48 grade for move child displacement.

[0094] Furthermore, while the grinding-stone drive motor 30 is connected through motor driver (motorised circuit) 86a and grinding-stone drive-motor 39a is connected through motor driver (motorised circuit) 86b, grinding-fluid feed-pump (grinding-fluid supply means) P is connected to the operation control circuit 80. This grinding-fluid feed-pump P supplies the grinding fluid filtered from the waste fluid tank which is not illustrated at the time of an operation to the grinding-fluid supply nozzles 60A and 61A.

[0095] Furthermore, the frame configuration measuring device 1 of drawing 1 is connected to the operation control circuit 80 through the communication port 88, and ball type configuration data, such as frame configuration data from the frame configuration measuring device (ball type configuration measuring device) 1 and lens configuration data, are inputted into it.

[0096] And the movement magnitude detecting signal from a test section 42 is inputted into the operation control circuit 80.

[0097] The driving pulse of the motor 25 for a lens shaft drive by which operation control of this operation control circuit 80 is carried out based on the ball type configuration data (thetai, rhoi) from the driving pulse and the frame configuration measuring device 1 of the base drive motor 14, and stepping motor 59 grade, The anterior refracting interface of the spectacle lens ML in the ball type configuration data (thetai, rhoi) from the movement magnitude detecting signal from a test section 42 etc. (among drawing 7) It asks for the coordinate position of the field on the left-hand side of a spectacle lens, and the coordinate position of a posterior refracting interface (field on the right-hand side of the inside of drawing 7 , and a spectacle lens), respectively. It asks for KOBA thick Wi according to an operation from the coordinate position of the anterior refracting interface of the spectacle lens ML in this ball type configuration data (thetai, rhoi) for which it asked, and the coordinate position of a posterior refracting interface.

[0098] And when data reading from the frame configuration measuring device 1 and reading of the data memorized by the storage regions m1-m8 of data memory 82 are after a processing control start, the operation control circuit 80 performs processing control by time sharing, and reading of data and control of a layout setup, as shown in drawing 12 .

[0099] Namely, if the period between T3, ..., time tn-1, and tn is set [T1 time t2, and the period between t3] to Tn for T2, time t3, and the period between t4, time t1 and the period between t2

Periods T1 and T3 — Control enclosed with between Tn(s) is performed and they are periods T2 and T4 about reading of data or control of a layout setup. — It carries out between Tn-1. therefore, during the grinding process of a processed lens, reading storage of two or more following ball type configuration data, read-out, a layout setup (adjustment) of data, etc. can be performed, and the working efficiency of data processing can be boiled markedly and can be raised now

[0100] Moreover, the various programs for the motion control of lens grinding process equipment 2 are memorized by above-mentioned ROM81, and two or more data storage areas are prepared in data memory 82. Moreover, data storage area 83c which memorizes processing data storage area 83a which memorizes the processing data under present processing, new data storage area 83b which memorizes new data, frame data, processed data, etc. is prepared in RAM83.

[0101] In addition, FEEPROM (flash EEPROM) which can be written can also be used for data memory 82, and RAM of the backup power supply use to which it was made for the contents not to disappear even if the main power supplies were turned off can also be used for it.

The operation of lens grinding process equipment which has [Function], next the operation control circuit 80 of such composition is explained.

(i) In order to hold the maintenance spectacle lens ML of the spectacle lens by the lens supporting structure LH between the lens shaft 23 and 24, while moving the lens shaft 24 in the direction which deserts to the lens shaft 23 and extending the interval of the opposite back end of the lens shafts 23 and 24, a spectacle lens ML is made to carry out adsorption maintenance of the adsorption cup 202 of the lens adsorption fixture 200 at the whole surface (anterior refracting interface). Here, an anterior refracting interface says the field of the side which has projected the spectacle lens, and a posterior refracting interface says the concave surface side of a spectacle lens.

[0102] And while fitting the attachment base 201 of this lens adsorption fixture 200 into fixture attaching hole 23b of edge 23a of the lens shaft 23, positioning projected part 23c of the base of fixture attaching hole 23b is made to fit into positioning slot 201a of the attachment base 201. Under the present circumstances, when the axis of the optical axis of a spectacle lens ML and the lens shafts 23 and 24 is not in agreement, it is attached in the lens shaft 23 after the spectacle lens ML has inclined. in addition — the case where a spectacle lens ML is for astigmatism — a spectacle lens ML, on the other hand (posterior refracting interface), there is a curve for a pillar shaft In this case, if the change on the concentric circle in the spectacle lens for astigmatism is seen, the sine curve (sign curve) is drawn.

[0103] Moreover, the attachment base 211 of the lens presser-foot fixture 210 is beforehand attached or screwed on fixture attaching hole 24b of the lens shaft 24.

[0104] in this state, the lens shaft 24 is moved to the lens shaft 23 side, and the lens presser-foot fixture 210 attached in the edge of the lens shaft 24 is turned to a spectacle lens ML, and it marches out — making — four contact of the lens presser-foot fixture 210 — on the other hand (posterior refracting interface), a spectacle lens ML makes a member 215,215 contact under the present circumstances, the case where the spectacle lens ML inclines to the lens shafts 23 and 24, the case where a spectacle lens ML is an object for astigmatism, etc. — setting — four contact — the position where a member 215 contacts in a direction parallel to the lens shafts 23 and 24 will shift however, four contact — the time of a spectacle lens ML being alike on the other hand, and a member 215 contacting — rotation of the lens presser-foot fixture 210 — a member 214,214 — respectively — a center [axis of rotation / 213] — rotating — each rotation — contact of a member 214 — a member 215,215 is made to contact by the pressure of a spectacle lens ML equal on the other hand (posterior refracting interface) then, the lens shaft 24 is further moved to the lens shaft 23 side — making — the other sides of a spectacle lens ML — four contact — a spectacle lens ML can be made to hold between the lens shaft 23 and 24 by pressing down by the member 215 (pinching) this state — four contact — a member 215 will suppress the other sides of a spectacle lens ML by the equal pressure

(ii) If a main power supply is turned on from the reading start standby state of lens configuration data, it will judge whether the operation control circuit 80 has data reading from the frame configuration measuring device 1.

[0105] Namely, as for the operation control circuit 80, it is judged whether "data demand" switch 7c of a control panel 6 was pushed. And if "data demand" switch 7c is pushed and there is a data demand, the data of lens configuration information (thetai, rhoi) will be read into data reading field 83b of RAM83 from the frame configuration measuring device 1. While this read data is memorized by either of the storage regions m1-m8 of data memory 82 (record), a layout screen is displayed on a liquid crystal display 8.
(iii) Calculation, next the operation control circuit 80 of processing data While carrying out operation control of the test section 42 and making a feeler 101 contact the anterior refracting interface of a spectacle lens (processed lens) ML (contact) By carrying out operation control of the motor 25 for a lens shaft drive, and the stepping motor 59 based on ball type configuration data (thetai, rhoi), contact movement of a feeler 101 and the anterior refracting interface of a spectacle lens ML is relatively carried out based on ball type configuration data (thetai, rhoi). Under the present circumstances, a feeler 101 is moved to right and left according to the curve of an anterior refracting interface, and the movement magnitude to these right and left is measured by the test section 42 through measurement shaft 42a. The measurement signal from this test section 42 is inputted into the operation control circuit 80, and the operation control circuit 80 asks for the coordinate position of the anterior refracting interface of the spectacle lens ML in ball type configuration data (thetai, rhoi) based on the measurement signal from a test section 42.
[0106] Similarly, while the operation control circuit 80 carries out operation control of the test section 42 and making a feeler 102 contact the anterior refracting interface of a spectacle lens (processed lens) ML (contact) By carrying out operation control of the motor 25 for a lens shaft drive, and the stepping motor 59 based on ball type configuration data (thetai, rhoi), contact movement of a feeler 102 and the posterior refracting interface of a spectacle lens ML is relatively carried out based on ball type configuration data (thetai, rhoi). Under the present circumstances, a feeler 101 is moved to right and left according to the curve of a posterior refracting interface, and the movement magnitude to these right and left is measured by the test section 42 through measurement shaft 42a. The measurement signal from this test section 42 is inputted into the operation control circuit 80, and the operation control circuit 80 asks for the coordinate position of the posterior refracting interface of the spectacle lens ML in ball type configuration data (thetai, rhoi) based on the measurement signal from a test section 42.
[0107] Since the thing of an indication can be used [rather than / application for patent / No. 30279 / 2001 to] / for a concrete method in quest of the coordinate position of such an anterior refracting interface, or the coordinate position of a posterior refracting interface, the detailed explanation is omitted.
[0108] And it asks for KOBA thick Wi according to an operation from the coordinate position of the anterior refracting interface of the spectacle lens ML in this ball type configuration data (thetai, rhoi) for which it asked, and the coordinate position of a posterior refracting interface.
[0109] Then, the operation control circuit 80 is brought near data, such as the distance PD between pupils based on the prescription of a spectacle lens, and the frame geometrical pitch FPD, and a top, it asks for the processing data (thetai', rhoi') of the spectacle lens ML corresponding to lens configuration data (thetai, rhoi), and processing data storage area 83a is made to memorize it from an amount etc.
(iV) After this [grinding process], the operation control circuit 80 carries out operation control of the grinding-stone drive motor 30 by motor driver 56a, and carries out rotation drive control of the grinding stone 35 in the direction of a clockwise rotation among drawing 6 . This grinding stone 35 has a rough grinding grinding stone (common grinding stone), an arris grinding stone, a finish grinding stone, etc., as mentioned above.
[0110] On the other hand, based on the processing data (thetai', rhoi') which processing data storage area 83a was made to memorize, the operation control circuit 80 carries out drive control of the lens shaft drive motor 25 through the stepping motor driver 86, and carries out the roll control of the lens axes of rotation 23 and 24 and the spectacle lens ML in the direction of the counterclockwise rotation in drawing 6 .
[0111] Under the present circumstances, based on the processing data (thetai', rhoi') which

processing data storage area 83a was made to memorize, by carrying out operation control of the stepping motor driver 86 first in the position of i= 0, the operation control circuit 80 carries out drive control of the stepping motor 59, reverses the screw shaft 58, and drops a cradle 60 the specified quantity every. The lens shaft electrode holder 61 descends to a cradle 60 and one with descent of this cradle 60 by the self-weight of carriage 22, and the spring force of the spring 54 of the processing pressure adjustment mechanism 45.

[0112] Only a cradle 60 is dropped after the raw and circular spectacle lens ML contacts grinding side 35a of a grinding stone 35 with this descent by the self-weight of carriage 22, and the spring force of the spring 54 of the processing pressure adjustment mechanism 45. If a cradle 60 deserts the lens shaft electrode holder 61 by this descent at a lower part, this thing [having deserted] will be detected by Sensor S and the detecting signal from this sensor S will be inputted into the operation control circuit 80. After this operation control circuit 80 receives the detecting signal from Sensor S, drive control of the stepping motor 59 is carried out further, and only the specified quantity drops a cradle 60 minutely.

[0113] Thereby, in i= 0 of processing data (thetai', rhoi'), a grinding stone 35 carries out the specified quantity grinding of the spectacle lens ML. If the lens shaft electrode holder 61 descends in connection with this grinding and a cradle 60 is contacted, Sensor S will detect this, and will output a detecting signal, and this detecting signal will be inputted into the operation control circuit 80.

[0114] If this detecting signal is received, as this operation control circuit 80 can be set to i= 0, it will carry out the grinding process of the spectacle lens ML with a grinding stone 35 in i= 1 of processing data (thetai', rhoi'). And the operation control circuit 80 performs such control i=n (360 degrees), and it carries out a grinding process by the rough grinding grinding stone which abbreviated the sign of a grinding stone 35 for the periphery of a spectacle lens ML to becoming radius vector rhoi' at every angle thetai[of processing data (thetai', rhoi')] '.

[0115] such a grinding process — facing — four contact — since the member 215 is suppressing the rear face of a spectacle lens ML by the equal pressure, it has not produced the partial big internal stress by this pressing down in the spectacle lens ML for this reason, the contact this stress of whose is four although the pressure forced on a grinding stone 35 and the grinding pressure by the rotation grinding of a grinding stone 35 act on the periphery of a spectacle lens ML and stress acts on the interior of a spectacle lens ML — it can prevent certainly that the situation where it is added to the partial big stress by the pressing-down force of the spectacle lens ML by the member 215, and a spectacle lens ML is destroyed arises

[0116] While the operation control circuit 80 operates the pump P for grinding-fluid supply on the occasion of such grinding and making a grinding fluid 62 breathe out from the 1st grinding-fluid delivery (1st grinding-fluid supply means) 63 of grinding-fluid **** nozzle 61A, a grinding fluid 64 is made to breathe out from the 2nd grinding-fluid delivery (2nd grinding-fluid supply means) 65 of grinding-fluid **** nozzle 61A.

[0117] Under the present circumstances, a grinding fluid 64 is supplied from a normal to grinding side 35a of a grinding stone 35. And after this grinding fluid 65 fully flows to the lens grinding section 69 side with rotation of a grinding stone 35, and fully cools the lens grinding section 69 and it flows down on the lower base wall 11e2 with grinding waste, the uptake of it is flowed down it and carried out into the waste fluid tank which is not illustrated from 11f of drain pipes.

[0118] On the other hand, the operation control circuit 80 operates the pump P for grinding-fluid supply, makes a flabellate breathe out a grinding fluid 71 so that it may spread right and left on the center of the circular bottom wall 11e1 from grinding-fluid **** nozzle 60A, and makes it flow down so that it may spread right and left towards a lower part from the longitudinal-direction central upper-limit section of the circular bottom wall 11e1. Thereby, even if a part disperses in the lower part side of the circular bottom wall 11e1, grinding waste 70 and a grinding fluid 62 are washed out below by the grinding fluid 71 flowing down, and a uptake is flowed down them and carried out into the waste fluid tank which is not illustrated from 11f of drain pipes.

(in addition to this) two contact which adjoins each other when the contact member (contact projected part) 215 is made into four places, since the sine curve (sign curve) is drawn if the change on the concentric circle in the spectacle lens still for astigmatism is seen — it inclines

and comes out, and it will incline, a spectacle lens will be contacted, and the combination of a member 215,215 becomes easy [the same thing of a spectacle lens as an opposite direction for which four points are pressed down equally] Moreover, since KOBA ** of a spectacle lens is thin and lens intensity is weak, in the spectacle lens for astigmatism, that deformation is large poses a problem. however — even if there are terms and conditions, such as configuration change by the astigmatism of a spectacle lens and an inclination, by using the lens presser-foot fixture 210 by this example — a spectacle lens — each four contact — clamp ** received by the member 215 can be fixed, and deformation of a spectacle lens can be prevented in addition, contact — a member 215 — four — preparing — four contact — a member 215 is limited to this, although it is made to contact four places of the refracting interface of a spectacle lens — not having — contact — even if it forms a member 215 in four or more places, it is possible — it may carry out and you may prepare in two places
the example explained beyond the [modification 1] — rotation — a member 214,214 is held respectively free [rotation] to the axis of rotation (support shaft) 213 — making — rotation — although the member 214,214 showed the example it was made to rotate around the one axis of rotation 213 individually, it is not necessarily limited to this
[0119] For example, as shown in drawing 19 , while the support projected part 230,230 of the couple which keeps 180-degree interval in the apical surface of the attachment base 211, and counters it is protruded While being prepared in the axis of rotation 213 and one, and forming the axis of rotation 213 and the axis of rotation 231 which intersects perpendicularly and forming the axis of rotation 213,231 in the shape of a cross joint the rotation which was made to hold the both ends of the axis of rotation 231 free [rotation] to the support projected part 230,230 of a couple, and was mentioned above to the both ends of the axis of rotation 213 — it is good also as composition which attached the member 214,214 free [rotation] as shown in drawing 18
[0120] in this case, four contact — the time of a spectacle lens ML being alike on the other hand, and a member 215 contacting — rotation of the lens presser-foot fixture 210 — while a member 214,214 rotates focusing on the axis of rotation 230 — a center [axis of rotation / 213] — respectively — rotating — each rotation — contact of a member 214 — a member 215,215 is made to contact by the pressure of a spectacle lens ML certainly equal on the other hand (posterior refracting interface) therefore, the time of the grinding process of a spectacle lens ML — a spectacle lens ML — pressing down — the contact as a member — it can prevent certainly that press force, a grinding process pressure, etc. by the member 215 break
In the example explained beyond the [modification 2], guide plates P1 and P2 and the covering board 11a2, and 11b2 are also replaceable with guide plate P1' of the shape of a sector as shown in drawing 20 - drawing 16 , P2', and the circular covering board 300,300.
[0121] In this case, the notch 301,301 of the shape of a sector opened up on side attachment walls 11a and 11b is formed, respectively, and sector-like guide plate P1' and P2' are arranged, respectively so that this the notch 301 of each may be covered. This guide plate P1' and P2' have the same composition, and its composition is [the covering board 300,300] the same.
[0122] This guide plate P1' and P2' are attached in the internal surface of side attachment walls 11a and 11b removable on two or more screws B, respectively, as shown in drawing 20 and drawing 22 . Guide projected part G1' which projects in the side-attachment-wall 11a and 11b side as shown in drawing 20 (b), and G2' are prepared in this guide plate P1' (and P2').
[0123] This guide projected part G1' is circularly prolonged to ends along with the upper limb of guide plate P1' (or P2'), as shown in drawing 21 and drawing 22 . Moreover, guide projected part G2' is what protruded on the lower marginal center section of guide plate P1' (or P2') in the shape of an OFF pillar, and the upper surface is the guide side of a small-circle configuration.
[0124] Moreover, the pillar-like guide pin 302,302 is screwed on this guide plate P1' (and P2') removable by the metal by which it was arranged so that the both ends of guide projected part G1' might be touched, and mirror-plane processing of the peripheral surface was carried out.
[0125] Moreover, 303,303 is the guide slit prepared in guide plate P1' and P2'. This guide slit 303,303 is the same as guide slit 11a2' shown in the form 1 of implementation of invention, and 11b2'.
[0126] moreover, the axial insertion prolonged long and slender up and down to the covering

board 300 — while the hole 304 is formed, you make it located in the center of the margo-inferior section, and the guide projected part 305 of a small-circle configuration is formed
[0127] And the covering board 300 is infixed between side-attachment-wall 11a and guide plate P1' (and side-attachment-wall 11b and guide plate P2') while it is located between guide projected part G1' and G2'. And as shown in drawing 21 and drawing 23 , the circular upper surface of the covering board 300 was made to contact a guide pin 302,302, and the guide projected part 305,305 of the covering board 300 is in contact with the upper surface of guide projected part G2'. Moreover, seal member S (s) is infixed between side-attachment-wall 11a (and 11b) and the covering board 300 (300). in addition, the lens shaft 23 (24) — the seal member S and axial insertion — the hole 304 and the guide slit 304 are penetrated free [sliding]
[0128] Next, an operation of such composition is explained.
[0129] In such composition, if the lens shafts 23 and 24 rotate circularly up and down along with the circular guide slit 304,304, the covering board 300,300 will also move up and down circularly to the lens shafts 23 and 24 and one. Under the present circumstances, since it is shown to the covering board 300 to the upper surface by the guide pin 302,302 and is shown to the guide projected part 305,305 which is a lower small salient to it by the circular face of guide projected part G2', it is made to carry out radii movement up and down in the state with very little frictional resistance.
[0130] this rotation — following — axial insertion — since it permits that the lens shafts 23 and 24 and the covering board 300 are displaced relatively to radial [of the carriage fixed pivot 21], even if a hole 304 has a size error and an attachment error in each part of the covering board 300, guide member P1', and P2', it can permit smooth radii movement to the vertical direction of the covering board 300
[0131] Moreover, in this composition, it can clean easily by loosening Screw B, even if the grinding fluid and grinding waste which invade between guide member P1', side-attachment-wall 11a or guide member P2', and side-attachment-wall 11b flow down below, cannot collect easily and collect, since the both sides of guide projected part G2' have opened wide below, and removing guide member P1' and P2' from side attachment walls 11a and 11b.
[0132] Moreover, if the lens shafts 23 and 24 are moved in the direction of an axis with carriage 20, the lens shafts 23 and 24 will carry out sliding movement to the seal member S, guide member P1' and P2', and the covering board 300.
[0133]
[Effect of the Invention] As explained above, the lens supporting structure of invention of this application according to claim 1 In the lens supporting structure for having the contact section which contacts the refracting interface of a spectacle lens, and holding a spectacle lens the aforementioned contact section Since it considered as the composition which was divided into at least two and equipped with the contact salient which can be tilted independently, also in terms and conditions, such as configuration change by the astigmatism of a spectacle lens, and an inclination, clamp ** received in each contact section can be regularity-ized, and deformation of a spectacle lens can be prevented.

[Translation done.]

* NOTICES *

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2.**** shows the word which can not be translated.
3.In the drawings, any words are not translated.

DESCRIPTION OF DRAWINGS

[Brief Description of the Drawings]
[Drawing 1] It is explanatory drawing showing the relation of a lens grinding process equipment and a frame configuration measuring device equipped with the layout display equipment concerning the gestalt of operation of this invention.
[Drawing 2] The lens grinding process equipment concerning the gestalt of operation of this invention is shown, (A) is the perspective diagram of a covering closing state, and (B) is the perspective diagram of a covering opening state.
[Drawing 3] The lens grinding process equipment concerning the gestalt of operation of this invention is shown, (A) is the plan of a covering closing state and (B) is the plan of a covering opening state.
[Drawing 4] The lens grinding process equipment concerning the gestalt of operation of this invention is shown, (A) is expansion explanatory drawing of the 1st control panel, and (B) is the front view of a liquid crystal display.
[Drawing 5] The lens grinding process equipment concerning the gestalt of operation of this invention is shown, (a) is the perspective diagram of the processing principal part in a working chamber, and (b) is the cross section of covering Itabe of (a).
[Drawing 6] It is the outline cross section which meets the A–A line of drawing 5 .
[Drawing 7] It is the perspective diagram of a drive system including the composition of drawing 5 .
[Drawing 8] It is the perspective diagram which saw the carriage holding the lens shaft of drawing 7 , its base, etc. from back.
[Drawing 9] It is the side elevation showing the processing pressure adjustment mechanism and wheel base adjustment mechanism of drawing 7 .
[Drawing 10] It is explanatory drawing of the processing pressure adjustment mechanism of drawing 9 .
[Drawing 11] It is the control circuit view of the lens grinding process equipment of drawing 1 – drawing 9 .
[Drawing 12] It is a timing diagram for explaining control of the control circuit of drawing 11 .
[Drawing 13] It is explanatory drawing in which having carried out the cross section of the important section of this drawing 5 (b), and having shown it.
[Drawing 14] It is the side elevation of the lens presser–foot fixture of drawing 13 .
[Drawing 15] It is the right lateral view of drawing 14 .
[Drawing 16] It is the important section perspective diagram of the lens presser–foot fixture of drawing 14 .
[Drawing 17] It is the perspective diagram showing the axis of rotation of the lens presser–foot fixture of drawing 14 , and the relation of an attachment base.
[Drawing 18] It is the side elevation showing the modification of the lens presser–foot fixture of this invention.
[Drawing 19] It is the perspective diagram showing the axis of rotation of the lens presser–foot fixture of drawing 18 , and the relation of an attachment base.
[Drawing 20] (a) shows the lens grinding process equipment in which the modification of this

invention is shown, (a) is the perspective diagram of the processing principal part in a working chamber, and (b) is the cross section of covering Itabe of (a).
[Drawing 21] Explanatory-drawing **** which looked at the attachment section of the guide plate of drawing 20 from the working-chamber side.
[Drawing 22] It is explanatory drawing which looked at the guide plate and covering board of drawing 20 from the outside of a working chamber.
[Drawing 23] It is the perspective diagram of the guide plate of drawing 20 , and a covering board.
[Description of Notations]
ML ... Spectacle lens
LH ... Lens supporting structure
23 24 ... Lens shaft (lens axis of rotation)
200 ... Lens adsorption fixture
210 ... Lens presser-foot fixture
23b ... Fixture attaching hole
24b ... Fixture attaching hole
211 ... Attachment base 211
212 ... Support projected part
213 ... Axis of rotation (support shaft)
214 ... rotation — a member
215 ... Contact member (a press member, a lens presser-foot member, contact projected part)

[Translation done.]

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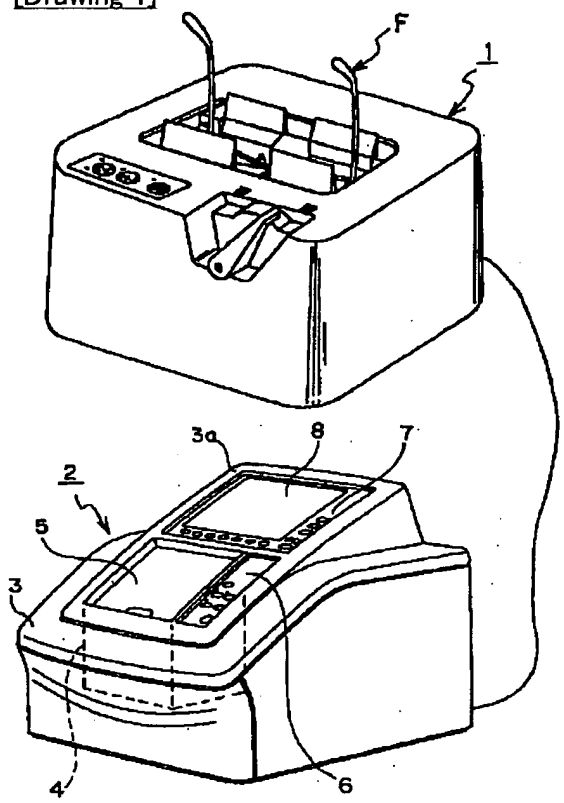
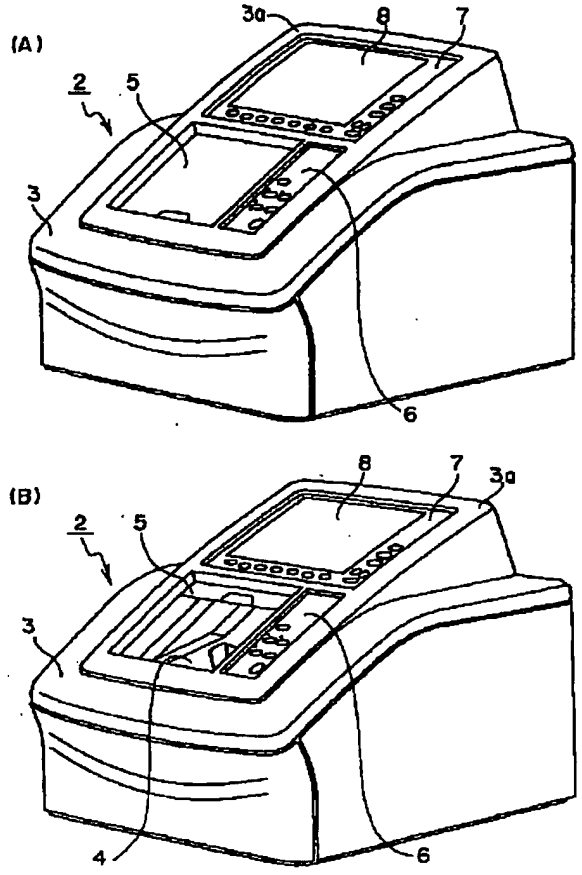
DRAWINGS

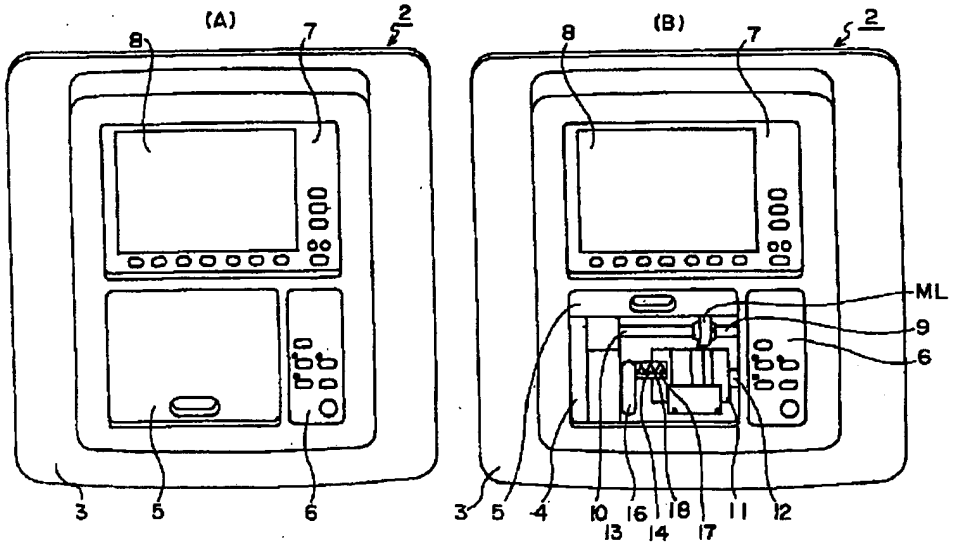
[Drawing 1]



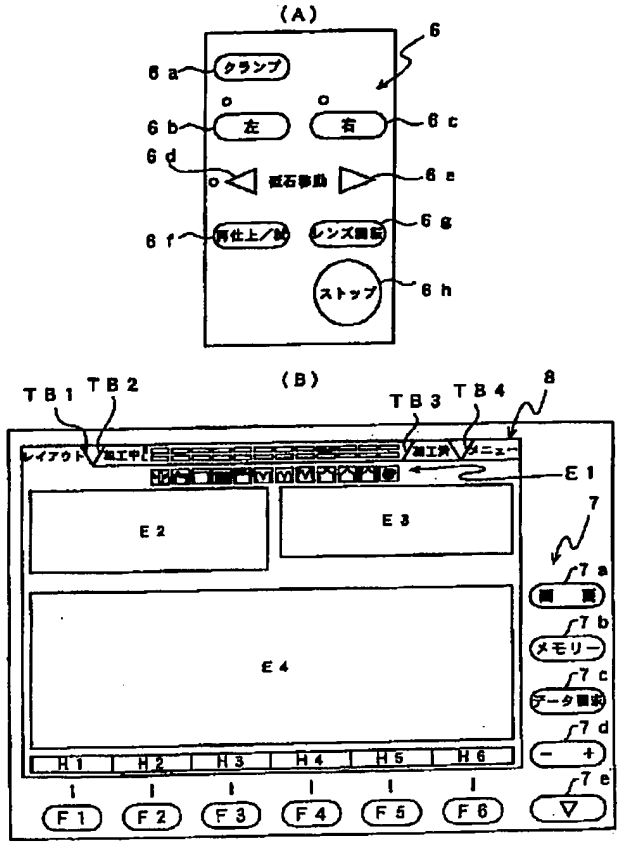
[Drawing 2]



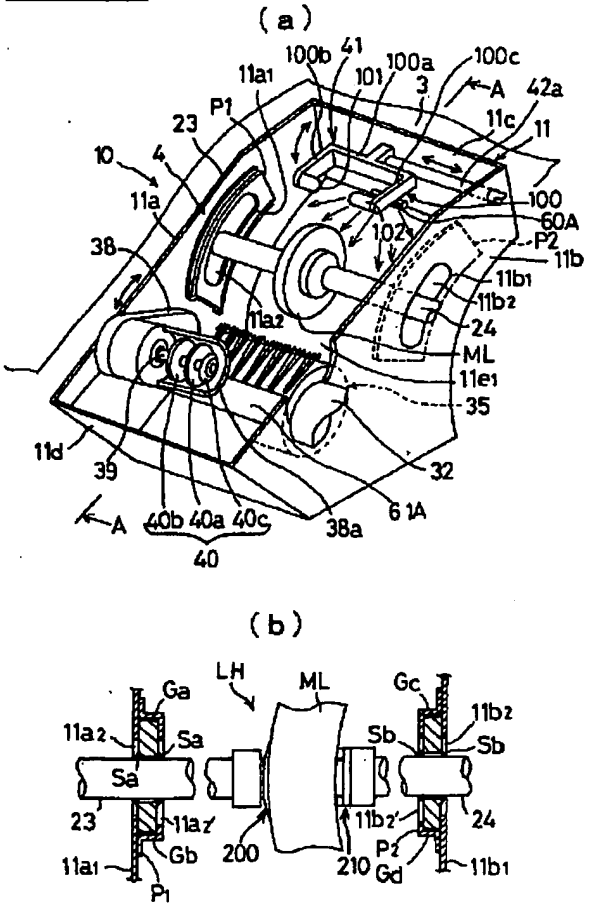
[Drawing 3]



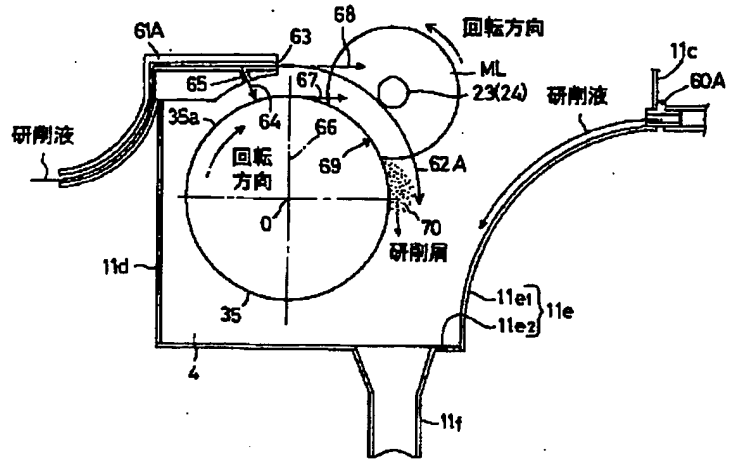
[Drawing 4]


(A)
6
6a
クランプ
6b
左
6c
右
6d
6e
6f
6g
レンズ調整
6h
ストップ
(B)
TB1
TB2
TB3
TB4
8
E1
E2
E3
E4
7
7a
7b
メモリー
7c
7d
7e
H1
H2
H3
H4
H5
H6
F1
F2
F3
F4
F5
F6

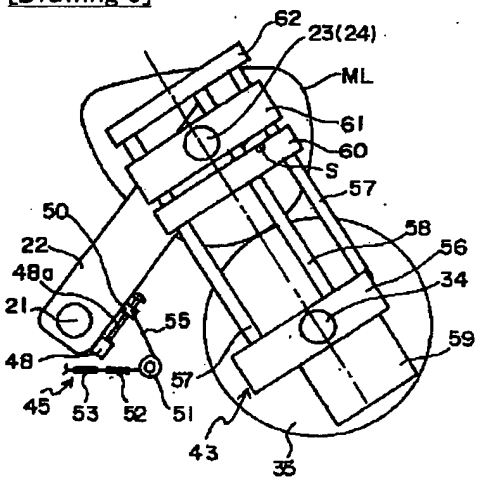
[Drawing 5]


(a)
100b
41
11a1
101
100a
3
100c
A
42a
P1
23
11c
11
10
4
11a
100
60A
102
38
P2
11b
11b1
11b2
11a2
24
ML
11e1
35
11d
39
32
A
40b
40a
40c
38a
61A
40
(b)
LH
ML
Ga
Gc
11b2
11a2
Sa
Sb
Sb
Sa
23
11a2'
11b2'
24
200
210
P2
Gb
Gd
11a1
11b1
P1

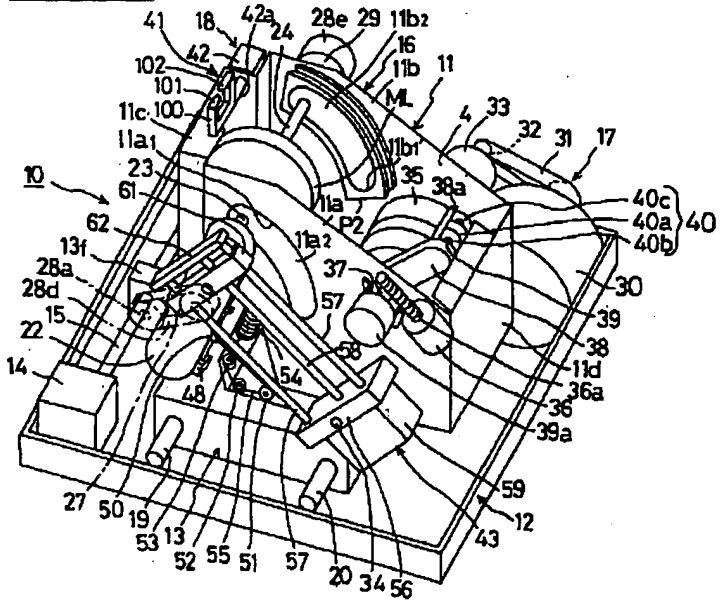
[Drawing 6]



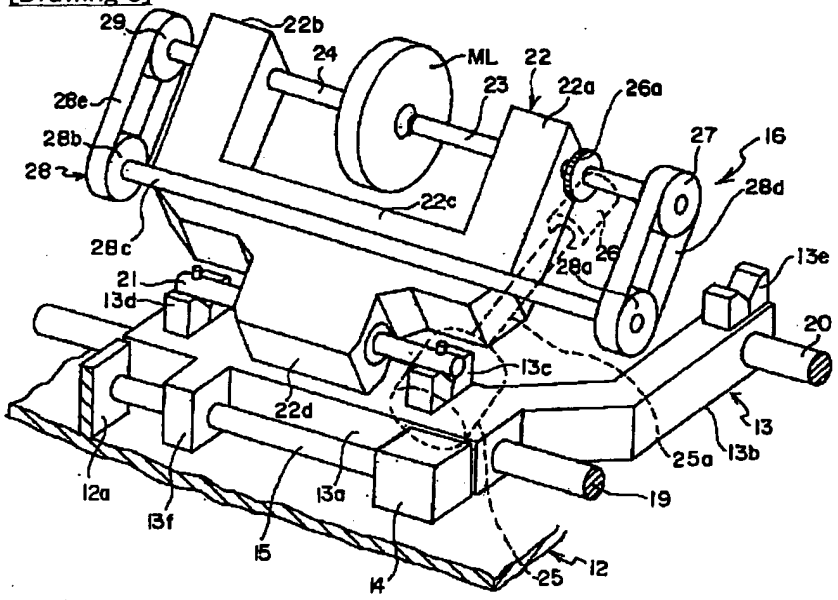
[Drawing 9]



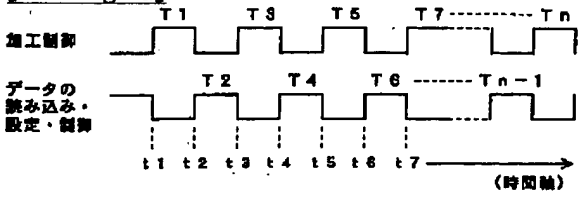
[Drawing 7]



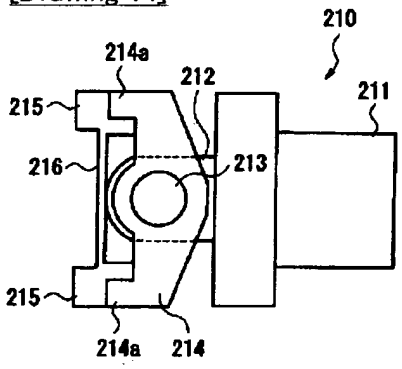
[Drawing 8]



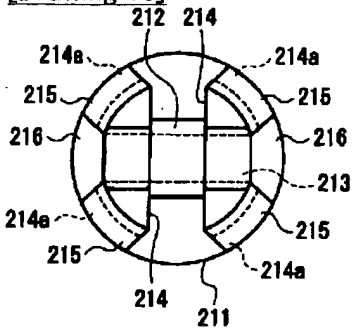
[Drawing 12]



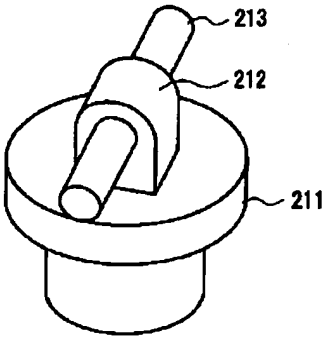
[Drawing 14]



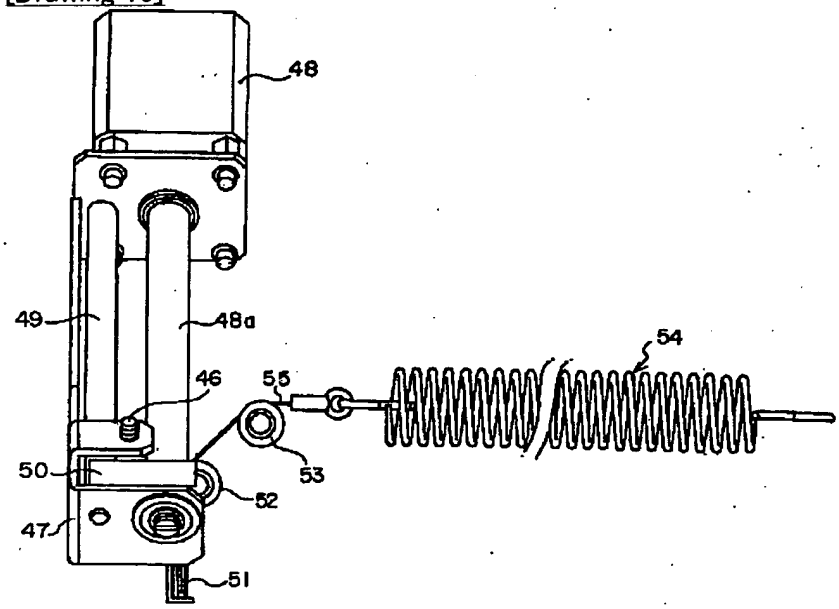
[Drawing 15]



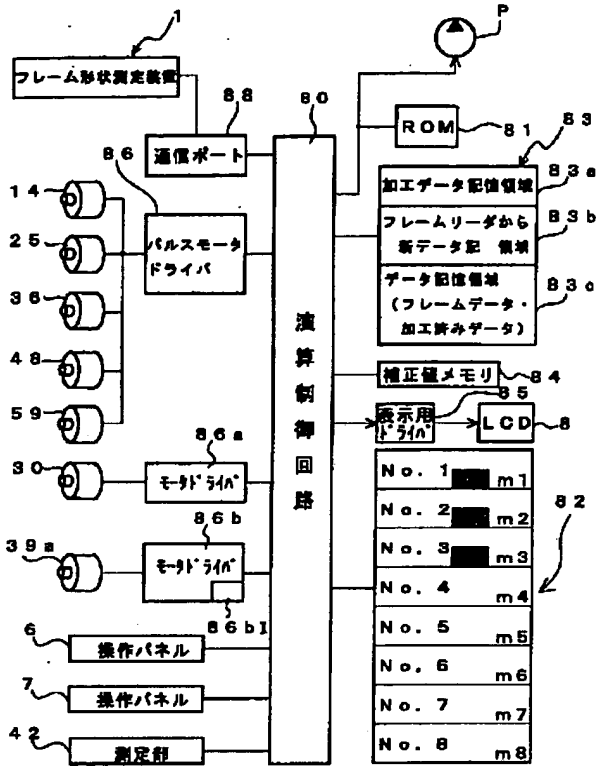
[Drawing 17]



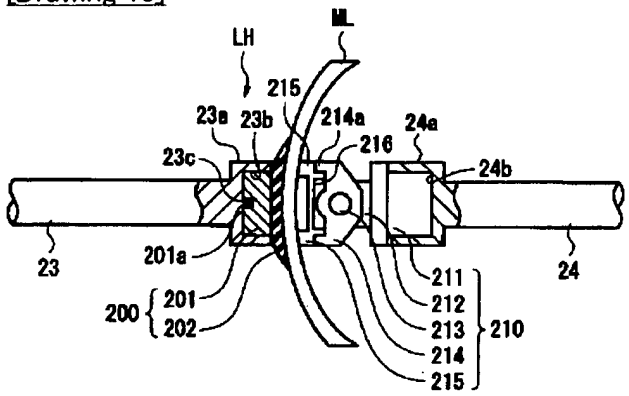
[Drawing 10]



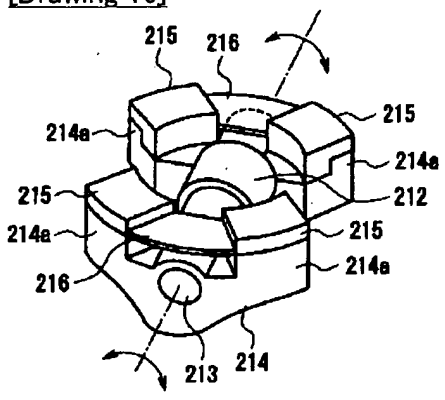
[Drawing 11]



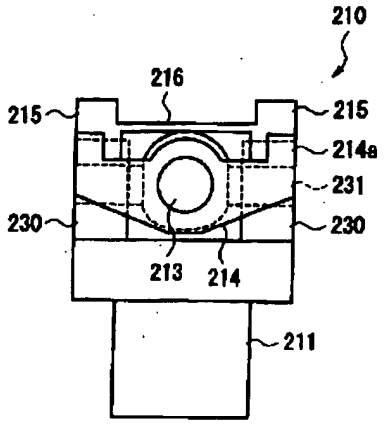
[Drawing 13]



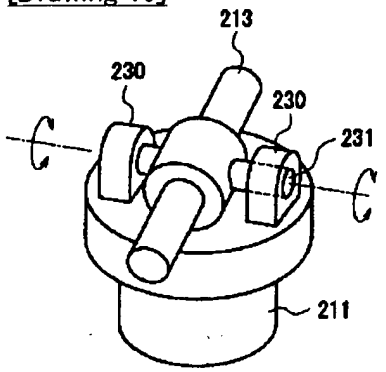
[Drawing 16]



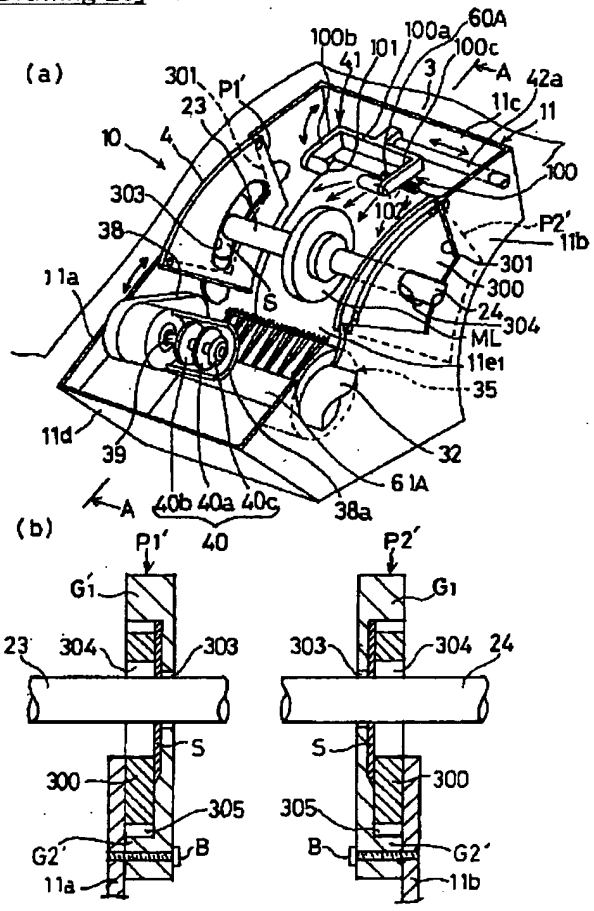
[Drawing 18]



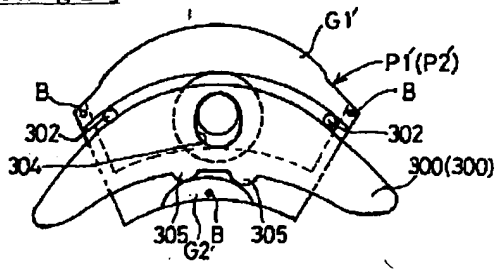
[Drawing 19]



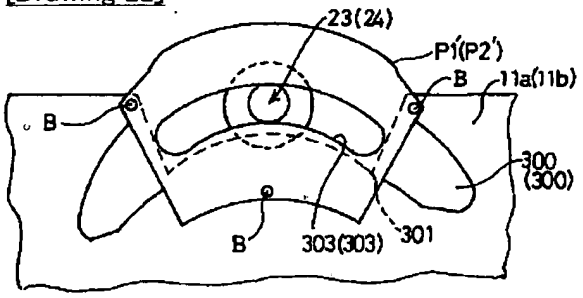
[Drawing 20]



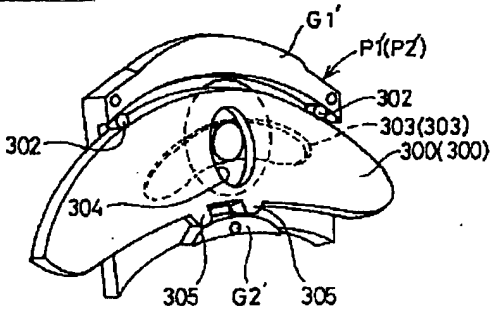
[Drawing 21]



[Drawing 22]



[Drawing 23]



[Translation done.]